

FLUKE®

Biomedical

ULT800

TEE Transducer Leakage Current Tester

Users Guide

PN 2461434

August 2005

© 2005 Fluke Corporation, All rights reserved. Printed in USA
All product names are trademarks of their respective companies.

Warranty and Product Support

Fluke Biomedical warrants this instrument against defects in materials and workmanship for one full year from the date of original purchase. During the warranty period, we will repair or, at our option, replace at no charge a product that proves to be defective, provided you return the product, shipping prepaid, to Fluke Biomedical. This warranty does not apply if the product has been damaged by accident or misuse or as the result of service or modification by other than Fluke Biomedical. IN NO EVENT SHALL FLUKE BIO-MEDICAL BE LIABLE FOR CONSEQUENTIAL DAMAGES.

Only serialized products and their accessory items (those products and items bearing a distinct serial number tag) are covered under this one-year warranty. PHYSICAL DAMAGE CAUSED BY MISUSE OR PHYSICAL ABUSE IS NOT COVERED UNDER THE WARRANTY. Items such as cables and nonserialized modules are not covered under this warranty.

Recalibration of instruments is not covered under the warranty.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state, province to province, or country to country. This warranty is limited to repairing the instrument to Fluke Biomedical's specifications.

Warranty Disclaimer

Should you elect to have your instrument serviced and/or calibrated by someone other than Fluke Biomedical, please be advised that the original warranty covering your product becomes void when the tamper-resistant Quality Seal is removed or broken without proper factory authorization. We strongly recommend, therefore, that you send your instrument to Fluke Biomedical for factory service and calibration, especially during the original warranty period.

In all cases, breaking the tamper-resistant Quality Seal should be avoided at all cost, as this seal is the key to your original instrument warranty. In the event that the seal must be broken to gain internal access to the instrument, you must first contact Fluke Biomedical's Technical Assistance Department at 775-883-3400. You will be required to provide the serial number for your instrument as well as a valid reason for breaking the Quality Seal. You should break this seal only after you have received factory authorization. Do not break the Quality Seal before you have contacted us. Following these steps will help ensure that you will retain the original warranty on your instrument without interruption.

Fluke Biomedical, 6920 Seaway Blvd., Everett, WA 98203 USA

Introduction

The ULT800 TEE Transducer Leakage Current Tester measures the leakage current of ultrasound transducers independent of their ultrasound systems. Use the hand-held, battery-operated instrument during the routine transducer cleaning procedure conducted between patients.

Connect the transducer to be tested to the ULT800 via a unique adapter. The ULT800 performs the measurement with the transducer immersed in either the cleaning solution or saline. To insure that the leakage current test is accurate, first test the conductivity of the fluid. A special dual element probe also connected to the ULT800 tests the conductivity of the fluid. A green **PASS** light or a red **FAIL** light indicates the results of the conductivity and leakage current tests.

In addition to verifying that the ultrasound transducers are safe for patient use, the ULT800 makes it possible to reduce expensive repairs. Identifying transducers that exceed safe leakage currents early may allow for repairs to be made before a transducer becomes non-repairable.

Key Features

- Hand-held instrument
- Stand-alone operation
- Direct measurement of leakage current
- Battery operation for safety
- Independent of 120 or 240V ac systems
- Built-in self-test circuit
- Auto shut off to conserve battery

Support

Customer Support and Sales

USA and Canada:	800.648.7952
Outside the USA:	775.883.3400
E-Mail:	sales@flukebiomedical.com
Internet:	www.flukebiomedical.com

Service

Service:	888.993.5853
Outside the USA:	425.446.5560
E-Mail:	service@fluke.com

For additional sales or service information, contact your local Fluke Biomedical Distributor or Fluke Electronics office.

Claims

Our routine method of shipment is via common carrier, FOB origin. Upon delivery, if physical damage is found, retain all packing materials in their original condition and contact the carrier immediately to file a claim.

If the instrument is delivered in good physical condition but does not operate within specifications, or if there are any other problems not caused by shipping damage, please contact Fluke Biomedical or your local sales representative.

Certification

This instrument was thoroughly tested and inspected. It was found to meet Fluke Biomedical's manufacturing specifications when it was shipped from the factory. Calibration measurements are traceable to the National Institute of Standards and Technology (NIST). Devices for which there are no NIST calibration standards are measured against in-house performance standards using accepted test procedures.

Obtaining Assistance

If you have trouble operating the equipment, or just need some clarification on its operation, contact Fluke Biomedical's Technical Assistance Center at 800-648-7952.

Returning the Instrument to Fluke

If it becomes necessary to return your instrument to Fluke, proceed as follows:

1. Every product returned to Fluke must have a Return Material Authorization (RMA) number. To obtain an RMA, contact Fluke through one of the following methods:

Phone: 888-99FLUKE (888-993-5853) or 425-446-5560

Email: service@fluke.com

2. Pack the instrument carefully, using the original packing materials if available. Failure to pack the instrument properly could void your warranty and result in you paying for the instrument's repair.

Insure the unit for full retail value and ship to the address specified by Fluke.

Controls and Indicators

Input connectors are interchangeable and provide for inputting an ultrasound transducer adapter and the dual conductivity electrode. Refer to Figure 1 and Table 1 for complete control and indicator descriptions.

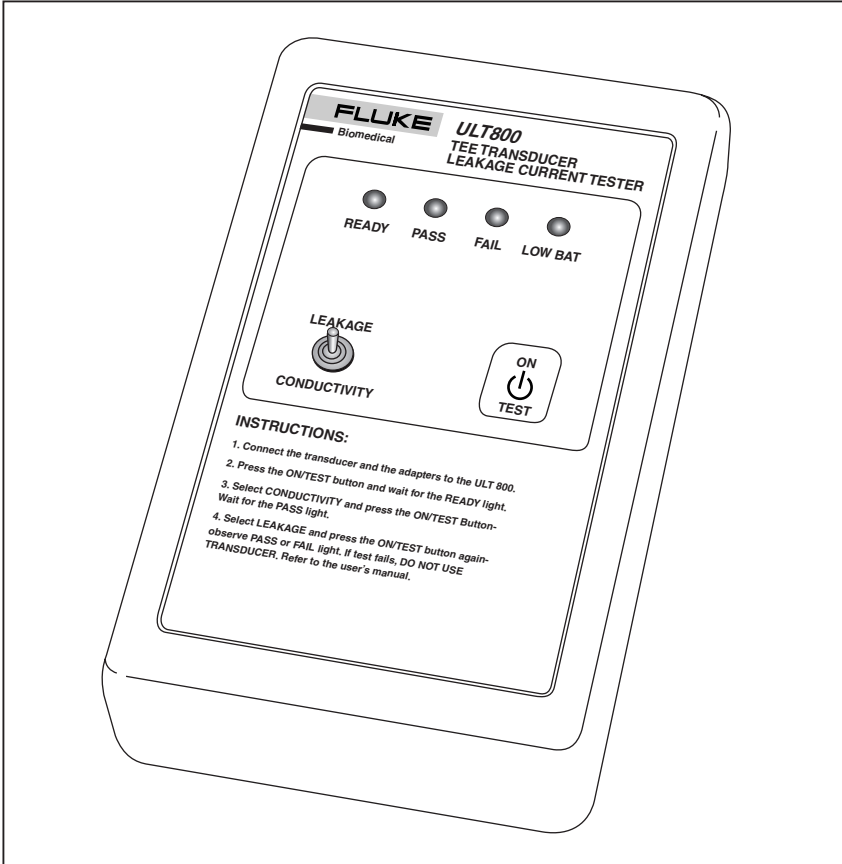


Figure 1. Controls and Indicators

ecy10f.eps

Table 1. Controls and Indicators

Item	Description
READY	Glows amber when the self-test procedure completes (approx. 8 sec.). The ULT800 is then ready for testing.
PASS	Glows green when either the Conductivity Test or Leakage Test passes.
FAIL	Glows red when either the Conductivity Test or the Leakage Test fails. Pulses red when the Leakage Test results in less than 20 μ A, indicating a possible open circuit condition with invalid test results.
LOW BAT	Flashes red to indicate that the battery requires replacement.
LEAKAGE/CONDUCTIVITY SWITCH	Selects the test to perform.
ON/TEST BUTTON	Turns the ULT800 on and initiates the selected test.
BATTERY COMPARTMENT	(not shown): Holds a 9-volt alkaline battery. The instrument automatically powers off if you do not perform a test within 12 seconds.

Specifications

Power: 9 V Alkaline Battery

No. of Measurements: Approximately 1000 measurements on a single battery

Conductivity: Limit to pass: greater than 250 $\mu\text{A} \pm 5\%$

Leakage: Limits to pass: less than 100 $\mu\text{A} \pm 5\%$ and greater than 20 $\mu\text{A} \pm 5\%$

Dimensions: 6.5 x 3.7 x 1.5 in. (17 x 19 x 4 cm)

Weight: 12 oz (340 g)

Environmental

Operation Temperature: 15 ° to 40 ° C

Storage Temperature: 15 ° to 65 ° C

Relative Humidity: 90 % Max

Using the ULT800

Warning

To avoid personal injury, do not touch the dual conductivity electrode rods. Voltage is present on the rods during a test.

Inspect the conductivity probe for damaged insulation or exposed metal. To avoid personal injury, replace a damaged conductivity probe before using.

Caution

To avoid damage to the transducer, observe the immersion levels. Do not immerse or allow the cable or connector of a transducer to become wet.

The ULT800 TEE Transducer Leakage Current Tester is a portable, self-contained, battery-operated device. It measures the leakage current of the devices attached to its connectors. The ULT800 applies 120 VAC, 60 Hz to devices placed in a conductive bath (basin or storage tube). The ULT800 measures the current and compares the results to an internal threshold. The instrument displays the results as a **PASS** or **FAIL** indication. It also performs an internal self-calibration on each measurement cycle.

The ULT800 makes two types of measurements. The Leakage Test measures the current between the probe and the electrode. The Conductivity Test measures the conductivity of the bath solution between the two electrodes.

Figures 2 and 3 show some typical test setups. Figure 2 shows the HP/Agilent Disinfection Basin (HP Part No. 21110A). Figure 3 shows the ATL Disinfection and Storage Tube. You can use other setups, as long as you observe the following rules:

1. Connect the ultrasound probe you are testing to the probe adapter. See the list of available adapters under Accessories.
2. Place the probe you are testing in a saline bath with the entire critical area of the probe fully immersed.
3. Place the dual electrode (Part No. 2392502 or 2392569) in the saline bath to a depth of at least one inch.

4. Plug the probe adapter and the electrode wire connectors into the ULT800. The connections are fully interchangeable.

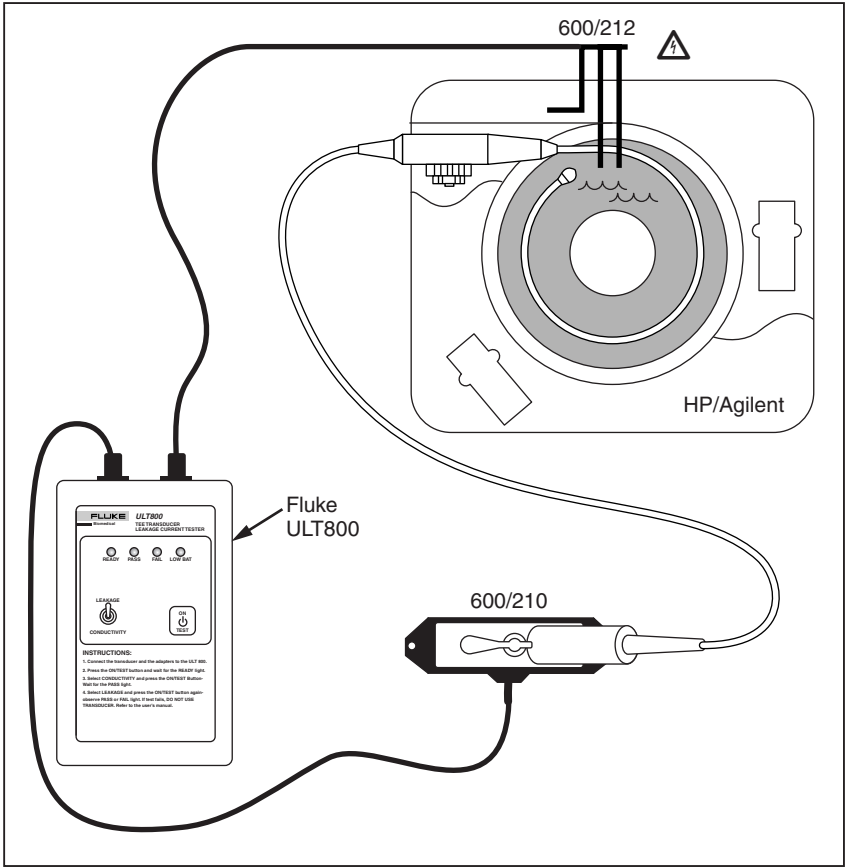
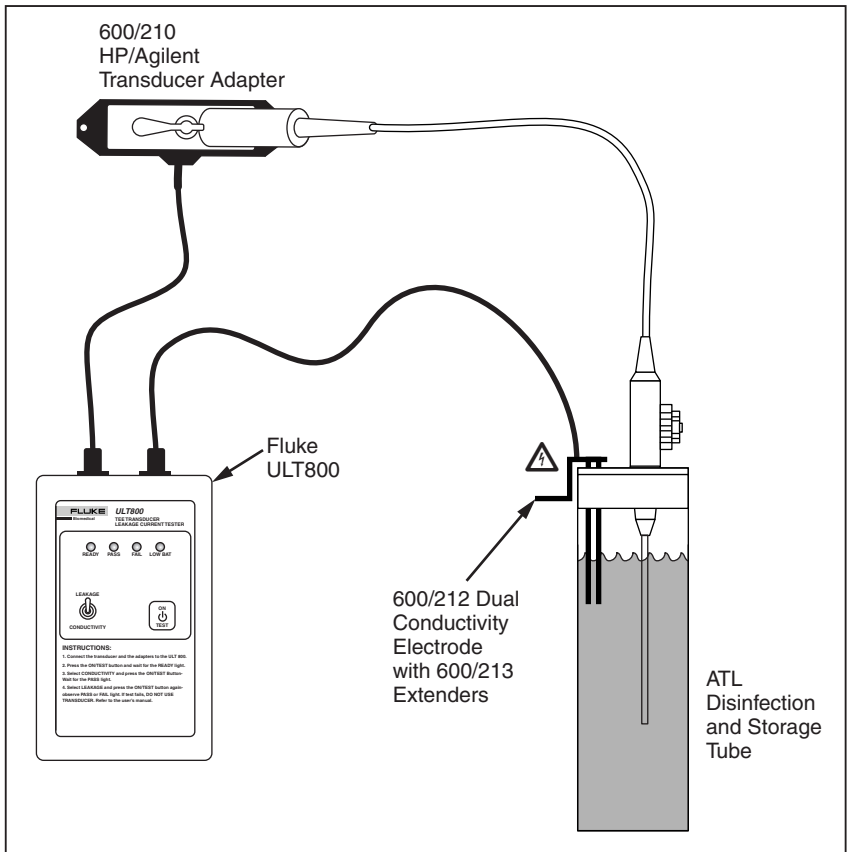


Figure 2. HP/Agilent Disinfection Basin Test Setup

ecy02f.eps



ecy03f.eps

Figure 3. ATL Disinfection/Storage Tube Setup

Checking the Battery

Note

The **LOW BAT** light flashes red to indicate that the battery needs replacement.

1. Use the **LEAKAGE/CONDUCTIVITY** switch to select **CONDUCTIVITY**.
2. Press the **ON/TEST** button to turn on the ULT800.

The self-check routine starts, calibrating the unit. All four LED indicators flash in sequence, continuing for five cycles. The **READY** light glows amber when the self-test routine completes with a successful battery test.

Checking Solution Conductivity

Note

The LED indicating a test result remains on for 12 seconds. The ULT800 then powers off to conserve the battery. To resume testing, power on the ULT800, allow the self-check/battery test to complete, and then reinitiate the test.

1. Select **CONDUCTIVITY**.
2. Press the **ON/TEST** button to perform a measurement cycle.
3. At the end of the measurement cycle (two seconds), the LED indicates the results of the test.

The green **PASS** light illuminates if the solution passed the Conductivity Test. The red **FAIL** light illuminates if the solution failed the Conductivity Test. Check that you have immersed the electrodes to a depth of at least 25 mm (1 inch) and that they are firmly connected to the ULT800, then retest. If the failure repeats, replace the solution and then retest.

Testing for Transducer Leakage Current

Note

Perform the Leakage Test only if the Conductivity Test passes.

1. Select **LEAKAGE**.
2. Press the **ON/TEST** button to perform a leakage measurement.

The green **PASS** light illuminates if the transducer passed the leakage current test. The red **FAIL** light illuminates if the transducer failed the leakage current test. If there is less than 20 μA of leakage current, the red light pulses, indicating a possible open circuit condition with invalid test results.

Maintenance

Your ULT800 needs little maintenance or special care. However, treat it as a calibrated measuring instrument. Avoid dropping or other mechanical abuse that could cause a shift in the calibrated settings.

Cleaning

Caution

Do not pour fluid onto the ULT800 surface; fluid seepage into the electrical circuitry may cause ULT800 failure.

Caution

Do not use spray cleaners on the ULT800; such action may force cleaning fluid into the ULT800 and damage electronic components.

Clean the ULT800 occasionally utilizing a damp cloth and mild detergent. Take care to prevent the entrance of liquids.

Wipe down the adapter cables with the same care. Inspect them for damage to and deterioration of the insulation. Check the connections for integrity.

Battery

⚠ Warning

The 9-volt alkaline battery provided with the ULT800 may explode or leak if recharged, inserted improperly, disposed of in a fire, or mixed with different battery types. Dispose of the battery in accordance with any applicable state or local regulations.

The ULT800 uses a standard 9-volt alkaline battery. The battery has a life expectancy of approximately 1000 measurements. Replace the battery yearly, regardless of its condition.

Calibration

⚠ Warning

Examine the calibration label on the back of the ULT800 prior to each use. Do not use a ULT800 with an expired calibration label. A ULT800 without a calibration label or with the anti-tamper case label broken is out of calibration. A ULT800 that is out of calibration can cause excessive leakage current exposure to the patient; risk of injury to the patient could result.

⚠ Caution

Avoid dropping the ULT800 or allowing other mechanical abuse that could cause a shift in the ULT800's calibrated settings.

The ULT800 requires yearly Fluke factory calibration, which uses appropriate tools and reference instruments that are traceable to the National Institute of Standards and Technology (NIST). Factory calibration provides a calibration sticker on the back of the ULT800 to verify that the calibration was performed.

To locate a service center, visit the Fluke web site at www.fluke.com, or contact Fluke at service@fluke.com. Call from anywhere in the world at +1-425-446-5500 or call for service in the USA at 1-888-99-FLUKE (1-888-993-5853.)

Accessories

Refer to Table 2 for a list of transducer adapters and other accessories for the ULT800.







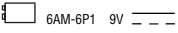
Table 2. Accessories

Part Number	Model Number	Description
2392430	600/156FG	Ultrasound Transducer Adapter – Siemens/Acuson 156 series probes
2392453	600/202FG	Ultrasound Transducer Adapter – GE YMS/RT
2392466	600/203FG	Ultrasound Transducer Adapter – GE CGR
2392475	600/204FG	Ultrasound Transducer Adapter – GE LogiQ
2231602	600/205	Ultrasound Transducer Adapter – GE LogiQ
2392482	600/210FG	Ultrasound Transducer Adapter – HP/Agilent
2392494	600/211FG	Ultrasound Transducer Adapter – HP/Agilent
2392516	600/213FG	Ultrasound Transducer Adapter – Acuson/Toshiba

Table 2. Accessories (cont.)

Part Number	Model Number	Description
2392540	600/216FG	Ultrasound Transducer Adapter – Hitachi
2392557	600/218FG	Ultrasound Transducer Adapter – Philips/ATL
2392578	600/260FG	Ultrasound Transducer Adapter – Siemens/Acuson 260 series probes
2231811	600/360	Ultrasound Transducer Adapter – Siemens/Acuson 360 series probes
2392591	600/MPFG	Ultrasound Transducer Adapter – Siemens/Acuson MP series probes
2392427	600/102FG	Chassis ground probe, 8-foot coiled cord
2231616	600/206	Universal ultrasound probe
2392502	600/212FG	Dual conductivity electrode
2392525	600/214FG	Hard-sided carrying case
2392533	600/215FG	Conductivity cable
2392569	600/220FG	Dual conductivity probe

Symbols

Symbol	Description
	See Users Guide
	Caution: risk of electric shock
	Standby – On
	Manufacturer's declaration of product compliance with applicable EU directives
	UL Listing mark
	Do not mix with solid waste stream. Dispose using a qualified recycler or hazardous material handler.
	9-volt battery

